DOCUMENT RESUME

ED 436 184 IR 019 809

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TITLE	Using Discourse Analysis as a Research Tool for Understanding User Navigation Models.
PUB DATE	1999-02-00
NOTE	12p.; In: Proceedings of Selected Research and Development Papers Presented at the National Convention of the Association for Educational Communications and Technology [AECT] (21st, Houston, TX, February 10-14, 1999); see IR 019 753.
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Cultural Influences; *Design Preferences; *Discourse Analysis; Educational Media; Higher Education; Instructional Design; Internet; Interviews; Models; *Navigation (Information Systems); Pilot Projects; *Schemata (Cognition); Time Factors (Learning); Use Studies; Users (Information); *World Wide Web
IDENTIFIERS	*Mental Models; Spatial Factors; *Technology Utilization

ABSTRACT

This paper examines how discourse analysis can be used as a methodology for understanding the mental models that influence how people navigate the Internet. Discourse analysis provides a methodology with which to articulate the relationships between language, social context, and the cognitive processes that underlie discourse perception and production. Results are described of a pilot study that asked participants about how they navigate the Internet, as well as how they conceptualize space and time while using the World Wide Web. Four education graduate students were interviewed for the study, and their answers were audiotaped and transcribed. By providing a clearer sense of how people construct their experience while on the Internet, the study begins to present techniques for analyzing end-users that help to clarify more culturally relevant technology-based pedagogies. The goal is to discern strategies for studying people to help design educational media, such as educational Web sites, that take into consideration not only how educational media is structured, but also consider the guiding mental models that influence learning on the Internet. (MES)

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Using Discourse Analysis As A Research Tool For Understanding User Navigation Models

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Introduction

The purpose of this paper is examine how discourse analysis can be used as a methodology for understanding the mental models that influence how people navigate the Internet. Discourse analysis provides a methodology with which to articulate the relationships between language, social context, and the cognitive processes that underlie discourse perception and production. This paper describes the results of a pilot study that asked participants about how they navigate the Internet, as well as, how they conceptualize space and time while using the World Wide Web. By providing a clearer sense of how people construct their experience while on the Internet, this study begins to present techniques for analyzing end-users that help to clarify more culturally relevant technology-based pedagogies. The goal of this paper is to discern strategies for studying people to help design educational media, like educational web sites, that not only take into consideration how educational media is structured, but that also consider the guiding mental models that influence people's learning on the Internet. In meeting this goal this paper argues that, "It's not just what you do while learning on the Internet, or even just how you are doing it, it's always who you are and what you're doing when you are learning."

"Discourses" have come to mean more than language to include such categories as visual representations, as well as texts (Fairclough, 1992), including World Wide Web content that combine words and images. For the purposes of this study, discourses analysis will mean studying how language is embedded in social practice through which diverse social entities are formed and transformed as the result of history and practice. In this sense, discourses are always social and the result of histories. All of the discourses that an individual participates in are based upon individual identities and social affiliations that can be incompatible and produce conflicts that are often confronted based upon individual social positions. Discourse analysis provides tools with which to describe how the complexities of multiple and conflicting social identities influence how individuals navigate and understand electronic information spaces. This study will use discourse analysis to begin to articulate the mental pictures that influence people's perceptions. I will call these mental pictures **cultural models.**

Cultural models have been developed by Gee (1996) and Strauss and Quinn (1997) to study mental models in social contexts. While Gee's approach to cultural models describes how people conceptualize literacy and the social and political implications of these perceptions, Strauss and Quinn's approach tries to integrate a cognitive approach to understanding opinion formation by showing how individuals negotiate attitudes based upon internal schemas that are influenced by social and cultural contexts.

The Internet provides a unique context for educational research. Not only is it increasingly occupying the public imagination as an important medium for learning, it is also being positioned by large telecommunication, computer industry, and entertainment corporate interests as a medium for people to carry out the daily functions of middle class life such as shopping, banking, entertainment, etc.. Because the Internet can now be accessed from a variety of locations including home, school, work, the library, etc. and because of the decentralized nature of Internet content, the World Wide Web allows for different conceptions of time and space compared to other educational media like video and CD-ROMs. Depending upon how one has access to the Internet, it is open 24 hours a day, 7 days a week in any place in the world where access exists. One's sense of time and space, experienced through cultural models about time and space, can become compressed or expanded depending on how one approaches this medium. One's cultural models define much of the Internet learning experience. This study begins to see how people are using the Internet in relation to how they conceptualize themselves, Internet content, and time and space while navigating the World Wide Web, as well as, if it is possible to discern the cultural models that people bring to these areas of interest.

Four people were interviewed for this study and their answers were audio taped and transcribed. Each interview took approximately 20-30 minutes. Participants were asked questions about how they used the Internet, what they liked and disliked about particular web sites that they frequent, and about their experiences in relation to the way that they conceptualize time and space while using the web. Specific questions asked of each participant include:

1. How long have you been using computers?
2. How long have you been using the World Wide Web?
3. How often do you use the web each week?
4. How long do you use the web each day?
5. Tell me about a site that you particularly like.
6. Tell me about a site that you particularly dislike.
7. For what kinds of things do you use the web?
8. What is your perception of time when you use the Internet?

Follow-up questions were then asked to clarify their answers to the above questions.

Cultural Models

Gee (1996) calls cultural models, "pictures of simplified worlds in which prototypical events unfold." He notes that people are often unaware of their cultural models and therefore cultural models appear to be "natural" and inevitable even though cultural models vary across social groups and change over time. According to Gee, "They allow us to function in the world with ease, but at the price of stereotypes and routinized thought and perception." Cultural models form the basis of choices and guesses about meaning within particular communities -- they always include a conception of what is acceptable and unacceptable to do within that cultural model. Gee states, "It's not just *what* you say, or even just how you say it, it's always who you are and what you're doing when you say it."

Strauss & Quinn's work has shown how people's cultural models interact with each other and how they interact within various contexts. Cultural models vary in both content and form. The process of cultural model interaction can take the form of **integration**; as people modify their cultural models to make them more consistent with each other. They also observe that people are capable of possessing inconsistent cultural models without experiencing a sense of dissonance. They call the process of maintaining two inconsistent models **compartmentalization**. According to Strauss and Quinn belief systems are partly integrated and partly compartmentalized. When looking at peoples cultural models, Strauss and Quinn observed three things: 1) the content (i.e. the ideas expressed) of people's talk, 2) the voice (i.e. characteristic mode of expression) they use to express the content, and 3) the temporal continuity and discontinuity (i.e. expressed in connected or disconnected discourse contexts) in the expression of the content. The analysis of the interview transcripts focused on these three areas of observation, as well as, the social language(s) that participants used to answer the questions.

A **social language** conveys a socially situated identity that communicates affiliations based on profession, ethnicity, race, gender, nation, etc. (i.e. social identities), as well as, communicates status within and between those affiliations. Individual often switch between social languages depending on who they are communicating with and how they want to communicate themselves to the other person. Looking at a person's social language reveals who they think themselves to be within a communication and who they think their audience to be.

Participant Profiles

The four participants represent a convenience sample of Education graduate students at a large Mid-west research university. They have been using the Internet for at least 2 years. Pseudonyms are used in this paper to assure participant confidentiality. Participants were asked to be a part of a study that is interested in looking at the ways that people use the Internet. In order to help avoid sensitizing the participants to the questions, participants were not given specifics about the study until after the interviews when the study was explained to them in more detail.

The profiles of the four participants include:

Ron -Ron is a European American in his early forties. He served in the military during his twenties where he worked in electronics. After his tour, he worked as a Park Ranger and educator for the US Park Service, before becoming a school district technology coordinator. In the past year he has returned to school to pursue a Ph.D. in Educational Technology. Ron has a great deal of experience using computers and helping others use computers and uses the Internet two to three hours a day to look at technology news and current events.

Patricia - Patricia is a Mexican American in her mid-twenties. She is bilingual and grew up in Austin, Texas where she visits frequently to see her family. She earned her Bachelors degree in Communication Arts and is currently employed in the production department of a public television station. She is also presently working on her Master's degree in Educational Technology and eventually hopes to design new media, like CD-ROMs, for children. She is particularly interested in creating new media that are geared towards multilingual children.

Laura – Laura is a European American in her late twenties. She earned an undergraduate degree in Secondary Education, German, and Political Science. Currently she is employed as a librarian in the university's Instructional Media Center. She is working on her Master's degree in a Library graduate school where she is studying to become a library media specialist. As a library media specialist she hopes to help teachers integrate the Internet into their curriculum. She considers her experience using the Internet and computers as intermediate.

Jan – Jan is a European American in her late thirties. She earned her bachelors degree in art. She has spent most of her working life in advertising as a graphic design consultant in marketing and advertising. Currently she is teaching in the Journalism department at the university in which this study was conducted where she is also working on her Ph.D. Of the three participants she is the least experienced with computers. During the time of the study, she had just purchased a new computer and was looking forward to spending more time learning new software and spending time on the Internet.

All of the participants had frequent access to the Internet either through the university, work, or at home and often through various combinations of the three. The participant's experience with computers and the Internet is summarized in *table 1*.

Table 1

Participant	Computer Experience	Internet Experience	Internet Use
Ron	Advanced	4 years	Daily 10-12 hrs / week
Patricia	Low to Moderate	1-2 years	Not Daily 3 hrs/week
Laura	Moderate	3 years	Daily 2-3 hours/week
Jan	Low	1 year	Not Daily (2-3 times/week) 3-4 hours/week

Data Analysis

Since the purpose of the study was to begin to find the participants cultural models of Internet usage and conceptions of time and space when using the Internet, the analysis was divided into sections of **usage**, **time** and **space**. The analysis will show schemas present for each of these categories, as well as, how at times these categories overlap, reference each other, and occasionally contradict each other. For the purpose of this paper **schemas** will represent the major themes that emerged form the interviews. Schemas will act as data organizers, as well as, indicators of cultural models. The data suggested that the participants had not spent a great deal of time reflecting on the ways that they use the Internet; therefore they rarely consciously went on a meta-cognitive level in their, mostly short, answers. This seemed to be the first time that they had thought about these issues.

It appeared as if the more time that the participants had spent using the Internet, the more that they felt capable of analyzing their Internet usage. This relationship was generally also true for their confidence in critiquing Internet content. Patricia, for example, gave "contextualizing signals"9 (i.e. a speaker's signals about what they take the context to be and what sort of person s/he takes the listener to be) that indicated that she was not confident in her answers. She often criticized her answers and devalued her opinions. The following sample from Patricia's interview, occurred just before she talked about her favorite web site:

> wool
> you can go to the
> taa
> wool, it's interesting
> cause usually you kinda
> I'm trying to think
> cuz I haven't been on it in a while
> but

Usage

Most of the data collected in the interviews relates to how the participants use the Internet in both their professional and personal lives. The major schema that emerged from all the participants was the **Internet as Information Resources** schema. This schema constructs the Internet as a place to retrieve information that benefits one's school or professional work, as well as, a place to acquire information for one's personal use like travel information. As will be related below, this schema perhaps best fits their social identities as graduate students. Within this schema there seemed to be two subtle distinctions, one developed by the participants who had used the web in a business context, and the other who had only used the web in school. The participants who had used the web as an information resource in business (Ron & Jan) seemed to be much more focused and deliberate in the way they used the web than those who had just used it predominantly at the University (Patricia & Laura).

The following quotes help to show how the **Internet as Information Resources** schema gets constructed:

9 Gee (1996)

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Patricia:

3. Most of the things that I use it
umm...for information
things mainly related to school
I really don't use it a whole lot as personal
and I want to
but I just for some reason
I just don't

Interviewer: How often do you think you use it a week, like how many hours would you approximate?

Patricia:

1. Hours a week?
Not very much.
I'd probably have to say 3
I mean, you know
Sometimes more like when I'm trying to find a lot of things
like where I'm trying to find clip art
or I'm. I have to find information
then I probably spend a lot more
but I've never actually calculated

2. I mean I can spend 2-3 hours a day on it
and that's finding
trying to find information that I need
but that doesn't come a lot
that doesn't
I don't usually try to
because I usually do it a little

Patricia sees herself as different from the "norm" of Internet users because she doesn't feel as if she uses it for personal reasons, calling herself an "oddball" because of this. Later in the Interview she does state a personal use of the Internet by observing that she uses it to look up airline fares. Even this practice has a utilitarian component since she mostly flies back to Austin to be with her family. "I go to Austin a lot". Living in two cultures, spending time in her family's culture seems to be important to her. Nevertheless, this falls firmly into the **Internet as Resource** schema.

Like Jan, Patricia said she does not use it for "pleasure" when she is in school, "When school starts I do everything in relation to school." It is interesting, however, that when asked to name a site that she particularly likes it is Martha Stewart's site, a place that has very little to do with school. The Martha Stewart web site seemed to predominantly be a marketing vehicle for Martha Stewart with its prominent sponsorship by the "Gap" and "BMW".

Maybe much of **the Internet as Resource** model is derived from a cultural identity of a graduate student where there is always work to be done, assignments to complete, reading to do, papers to write, etc.. Perhaps it is difficult to admit using the Internet for pleasure when it seems more appropriate for a graduate student to use it as an academic resource. Jan seems to support this hypothesis:

1. no, only
and it's only a function of my circumstances in school
I think that I can use
easily get lost on it

2. like if you had the same interview with me in August
I think it would be a very different interview
because I would have the summer to just be a human being
using the web verses a graduate student under pressure

In her view being a "human being" is not equated with being a graduate student.

Patricia echoes Jan's feelings:

1. I mean, I do
I have used it for pleasure
but that doesn't happen for very long but
but that usually more in like Christmas break
or in the summer when I don't have school

As a librarian Laura seems to mostly look at the Internet as a resource for *other* people

1. umm, I'd say
wool now it's probably daily
just because with my work at the education library on campus
a lot of the materials we find
are on the Internet for people so

Interviewer: ok, so you use it for your job (working at the reference desk at a library) when you re working and then as far as personal use?

Laura:

1. I'd say maybe once a week
Depends on what I'm really interested in finding
If there's something that I want to find out
then I'll use it more.

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She estimates that she uses it about an hour a week for personal use. Laura also uses the Internet as a replacement for newspapers and, like Ron, keeps up with current events using the Web.

Ron is the only participant in the study that admitted to, as he put it, "truly surf", following links without any particular purpose in mind. I call this Schema the **Internet as Information Frontier.** In this schema, a person chooses to spend free time following links without any particular purpose in mind. Ron follows this strategy about once a week, "Yea, it's probably like one day a week when I'll spend at some point just flippin' around just following, following the links." This usually occurs on Saturday. There may exist a gender component in the responses in relation to how one accesses the Web, where the act of moving around is more important to males and the final destination is more important to females. While one could not draw any general conclusions from this, the data did seem to support this hypothesis for the participants of this study and is exemplified in this exchange with Patricia:

Patricia: yea, I like to go just straight to it
Interviewer: right, without having to go through interim steps
Patricia: steps and yea
that usually
and I think that probably turns me off
more than anything else
Because I'm like "oh, forget it"

Jan in describing how she uses the Internet says, "so I'm kinda an observer." Although her first experience with the Internet was more free floating and exploratory, she had not settled into the **Internet as Information Frontier** as a regular part of her Internet experience. Nevertheless, she anticipated using the web more freely in the summer when she didn't have the responsibility of being a graduate student. It would be interesting to be able to watch the participants surf the Internet without the expectations presented by an interview. Would female participants experience the **Internet as Information Frontier** schema more than they would admit?

Space

An important Internet component for all participants was the **Internet as Interesting Visual Space** schema. All of the participants expressed in various ways how they were more attracted to as Laura put it, "visually interesting material". Ron, for example, uses visuals that he is attracted to as queues to look deeper into information at a site. In talking about the CNN site he notes:

I At a glance you can see
well the headline news
and if anything is happening
that I'm interested in
I can go right there and
and to get more details right away
and eventually see a video clip
and some visuals
and news about that

In general, all four participants did not want to use the Internet to read lots of text. They expressed a particular dislike for sites that are text-heavy. Laura says:

I because
if a site has really, umm
to much text
or too boring
then I probably won't stay there very long
which is not necessarily
a reflection on the content

Jan answers a question about her favorite web site with:

I there's a media literacy site
that I absolutely love
cause it has the most cool graphics
and it's so much fun

She also dislikes sites with too much text:

I I'm not at all enthralled by real textual pages
I kind of find em to be really dry
and dull
and I really just find them
dry and dull

It should be noted that computer monitors, depending on their quality, often make it difficult to read a great deal of text and can easily cause eyestrain. It is difficult to say whether or not this is the cause of the consistent call for less text and more graphics, although some of the responses indicated that it has had some bearing on this attitude. Laura also communicated a dislike for text-heavy sites and addressed the difficulty of reading from a computer monitor below:

Interviewer: Can you think of a particularly bad site that you didn't like?
Laura:
1 boy, lately
I've had to do a lot of readings
for my library classes
a lot of reserve readings have been on the Internet
that have just been
you know
full text things
2 and umm and so those are really
I mean
that's probably just the exercise of reading off the screen
for pages and pages
you know

Participants, in general, wanted to be able to easily jump to the information that they wanted. This schema is called, **Internet as organized Information Space**. Ron expressed his dislike for sites that had search features that don't work as he expects them to:

1 Sometimes you go into a company's site
and there will be a search button
implying that you can just search the site with this one button
and find a couple of links pointing in the right direction
2 But you click on a search button
and it either says "not working right now."
or it just doesn't point you to where you want to go anyway
so that's
that's a real turn off there
when features don't work like you expect them to

The last stanza echoes a common criticism that content presentation on the Internet is still inconsistent and that standards still do not exist in terms of individual expectations and larger medium wide expectations. The technology and techniques with which to organize data on the Internet are still quite early in their development.

Patricia, referring to why she likes the Martha Stewart site notes:
1 you go to her home page
and then I look at the tabs that say
you know television, magazine
I don't remember
blah blah, blah
and then you can click to that and go to it
and then
and then usually you can make
like one more click to get to the information
Like if it's a recipe on I don't know some kind of food
Later she says:
1 I think what turns me off
when I have to keep going layer after layer after layer
just to get what I want

When asked about a site that she particularly liked Laura described her use of Yahoo, a reference site that organizes listings of millions of web sites by subject. She says:
1 I used to use Infoseek and Excite
as the web engines
and then I finally realized that Yahoo
is much better for the type of searching that I like to do
the way it groups it
Later she states, "I'm interested in what kinds of sites people find helpful, user friendly." Laura helps library patrons find information on the web. When asked about a favorite site other than a search engine or directory site she described a peanut butter site saying:

1 it's just that the graphics
the graphics are nice
but not overwhelming
and the text is simple

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2 and I guess I like that kind
not too much text
at least at first and then the categories are
it's easy to understand,
it's easy to navigate
and um it's fairly quick as well

Included with her perspective is the **Internet as Interesting Visual Space** schema
1 I guess it was jazzy enough, too
jazzy is also a bad word
but umm, nice enough looking to keep my interest as well

As exemplified in this answer, Laura's answers were often couched in self-doubt. She was not confident in the opinions that she presented about the Internet. If one just looks at her triple major as an undergraduate (Secondary Education, German, and Political Science) and from conversations before, during and after the interview, it is apparent that she is an intelligent person with a broad liberal arts background. It was not immediately apparent what was operating to cause this doubt, whether it was something about my presence as an interviewer, or something unique about the Internet that challenged her confidence as an informed consumer and critic, or something about her own confidence, in general.

The Internet raises new issues about the perceived authority of the content within a web site. Typical measures of validity (i.e. books produced by established publishers) do not exist and individuals must judge content according to more individualistic criteria influenced by schemas and cultural models. Who creates the information spaces on the Internet (i.e. authorship) seems to take on a different meaning compared to other sources of information like books.

Jan was the only person who directly spoke of the authorship of a site. Speaking of the media literacy site that she likes, "somebody very sophisticated put this together." The perception from participant's answers is that a web site is not created by a person like a book, but is created by the organization or institution that hosts the site. Unless the site actually states the author's name, it seems as if people don't conceive of authorship in the typical text-based author/reader relationship. The content is just all "out there" , loosely connected but part of a whole with indistinguishable authors. Patricia, when describing using the web for school, does pay attention to how "legitimate" information is before using it in a paper. For her, information that is produced by governments is considered "legitimate". In doing a paper about literacy in Brazil she said, "and then we ended up using, like, a lot of, like, government sites."

Jan's fine arts and graphic arts background gave her authority to describe the media literacy site that she liked in more technical graphic design terms. She was quite confident in using this social language. It also was apparent that she is accustomed to dealing with people who don't share the same social language. She goes to extra lengths to explain to me what she likes about the media literacy site in stanza 1 below. In stanza 2 she speaks of the graphics in the media literacy site from the perspective of an artist and finally in stanza 3, she speaks of her dislike of animated icons on the web and makes a claim that "most people find them distracting." What gives her the authority to make this claim? Perhaps her background in advertising, according to her, gives her insight into what people like?

1 I think ... wool
going back to that web site on media literacy
what drew me was colors
and the energy
but I also think what's really, REally, REALLY important is simplicity and white space
that's what we call it in graphic design
where this
there's a place
there's a space for the eye to flow around
rather than just
putting too much on the page
I think that's hard to visually read
umm so I think you need to have things really clean
2 and that doesn't mean that they're not
like this this illustration on this media literacy page
was very kinetic and energetic
but then around it it was real clean
and so it was almost like a painting on a wall
and you had a sense of just
of space of it's own
so even of itself it was busy
the whole page wasn't busy

3 a pet peeve of mine
from a design standpoint
is those icons that do things for no purpose
you know, spinning things or flashing things
I just want to like ZAP them
I find them really distracting
I think most people find them distracting
it's really bad design

While the participants were not asked if they use the Internet to communicate with other people, Jan is the only person who raised the issue:

1. I remember being able to leave notes for people
because I was trying to find out
at that point
I was looking for information on Tiger Woods
I was really curious about what people thought of the new ads
that had come out

2. and I needed to get a couple of copies of things that I couldn't get my hands on
and so I was like finding these places where you could leave notes for people
and I was just
and I was so intrigued
and then I kept on trying to find more places that I could have a dialogue with people
or you know
find people with common interests
it's really engaging

This **Internet as Communication Space** schema would have been interesting to explore in greater detail with the participants. The Internet provides numerous opportunities to communicate with strangers about specific areas of interest.

Time

According to Barbara Adam (1995) everyone constructs their own meanings about time based upon their social, cultural, emotional, physical and psychological circumstance to create what she calls "social time". She notes that western style education has worked to socialize, habituate, and train people into a "clock time" approach to time which, in turn, has the effects of displacing the variety of times that comprise the multi-dimensionality of everyday life. The time of clocks and calendars (e.g. schedules, deadlines), "clock time" is only one aspect of social time. Because the Internet is always "open", those who use it are not confronted by the limitations of clock time and in turn, are liberated to construct their own unique forms of "social time."

While each participant was asked whether they ever lost their sense of time when using the Internet, rarely did they answer "yes". All the participants were very aware of the time they spent using the Internet and did not often loose their sense of time. Even Ron, who spends one day each week, "just surfing" plans this time deliberately. For him, as for the other participants it rarely happens by mistake.

When it does occur and they spend more time than anticipated, it is because they find something unexpected. For example, this occurred when Ron was looking at Apple computer's advertising firm, Chiatt/Day, to see some examples of their work. He was drawn into the site by the amount of information it offers about advertising and how the company researches people's buying habits and tastes. He spent "two or three hours" looking at the content that the site provided.

1. It was actually insight into the human psyche
more than anything else
or was actually just fascinating
they were talking about
it was about advertising
but it was also talking about things
about demographics in there
and what people are doing in different stages of there life
and how it wasn't as crass as how they manipulate you

2. but it was really interesting to learn that sort of thing
it had a very practical use
since it was an advertising company
it was practically oriented
it wasn't just esoteric

This information allowed him to go into **Internet Time,** when he either was not aware of the passage of time or didn't care. It would be interesting to see under what conditions people enter into **Internet Time.** Again, I

suspect that people go into **Internet Time** more frequently than they might like to admit, perhaps because the Internet occupies a unique position as both sources of information and entertainment. And therefore, it is more acceptable to use it as a source of information than as a place for entertainment. Granted, people use television both as a source of information and entertainment, however the line between the two is less clear. Rarely will a graduate student use the television to research a paper. It would be interesting to explore how, if it all, **Internet Time** may conflict with the **Resource** schema.

Ron describes Internet Time like a "flow."

I If there are not many distractions around me
yes, time can fly by pretty quickly
If people are in the room
or if I'm trying to do something else
like perhaps do the laundry or something like that
that will interrupt that flow

Later he says more:

Interviewer: Do you find that the element of surprise is something that intrigues you about sites in general? When you find something you don't expect to find and that's what might keep you there?
Ron: Yeah, I think that it produces, you know,
some sort of rush in my mind
you go somewhere and all of sudden you just
you go into that special time mode
where time is passing by and you're not conscious of it
your just following link after link after link
and could be reading and reading and reading
whereas you hadn't intended to do that when you got there
That is exciting and it's fun

Conclusions

The study constitutes a beginning for using discourse analysis as a methodology to understand the cultural models that influence how people navigate the Internet. While the sample studied for this project was small, the data produced by the interviews produced distinct themes and schemas that could be further developed with a larger sample and longer interviews into articulations of more general cultural models. The study functioned as a productive pilot for future research by showing that social identities and social languages contribute to how end-users perceive and understand Internet content, as well as , how these factors contribute to their sense of time and space on the Internet. For example, the study revealed that factors other than experience with the Internet influence the way that participants used and analyzed Internet content. Professional experience with information processing or visual design or business allowed participants to be more confident consumers through social languages developed in their professional life. In such cases, cultural models as computer or Internet novices were contradicted by cultural models developed through professional experience. In these circumstances they were able to compartmentalize the two cultural models (novice and professional) which allowed both to exist simultaneously.

Using discourse analysis to understand how people construct their Internet learning experience shows that discourses, social languages, and cultural models are fluid, dynamic and often contradictory. Such a methodology provides insights for educational media designers and researchers that help them to understand that even the best designed media, using traditional instructional design techniques, may not be effective because they fail to address how learning is a cultural process as much as a cognitive process. Using the techniques described above, educational technology researchers can develop a language to account for the cultural aspects that influence learning using technology. With increasingly multiethnic and multiracial populations in many parts of the world it will become more difficult to ignore how cultural models, based on various forms of difference, impact learning.

In order to more fully develop these ideas it will require studies that ask more in-depth questions about the participant's educational and professional background, as well as, their perceptions about how the Internet functions as an educational, information, and communication space for them. Further research might include studying people as they use the web using a protocol analysis. While protocol analysis present problems in that thinking aloud may alter a person's behavior, it might provide insight into the ways a person approaches constructing knowledge on the Internet that an interview may never reveal. For example, people may idealize or simplify ways that they use the Internet in an interview, where as actually using the Internet they may feel less self conscious and compelled to "make sense" of their habits. Even videotaping or monitoring the sites that a person visits while using the Internet would provide important information about the way people use the Internet. The computer can easily record each web site that a person visits and the amount of time that they spend at a site. The combination of the three types of data (interview, protocol analysis, and direct monitoring of usage) could provide a valuable source of data triangulation. Such a strategy would also be helpful in showing the schema contradictions, which often exist when looking closely at how people process information and construct knowledge.

Finally, it should be noted that discourse analysis in the context of educational media research is not being suggested as a means to create more efficient forms of instructional design that address just the right cultural models in just the right ways. Instead by showing the complex ways that cultural models, social identities, and social languages contribute to Internet-based learning experience it highlights that new design paradigms are needed that work within multiple discourses across gender, race, ethnicity, class, nation, etc. These new design models would strive to work within ambiguity and uncertainty rather than strive for efficiency. Discourse analysis provides a set of tools with which to begin this rethinking process by mapping and naming the complexities of this shifting terrain.

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